

New aspects concerning the Prato-Sillaro Lineament and the hypothesis of an external Emilian trough in the Northern Apennines geosyncline (Italy)

by

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Introduction :

The *external Emilian trough* of REUTTER & SAMES, 1964 includes amongst other units the Modino-Cervarola Unit (MCU). The *Prato-Sillaro Lineament* (PSL) of GROSCURTH & HEMMER 1973 [cf. BORTOLOTTI 1966; GHELARDONI 1965] traverses the Emilian and Umbro-Romagna Facies and has been a synsedimentary fault zone from the early beginnings of the geosynclinal development.

Does an external Emilian trough exist?

An external Emilian trough could have existed at least as far as the Oligo-Miocene part of the Modino-Cervarola Unit (MCU) is concerned. New lithofacial and biochronological correlations carried out by the author and sponsored by the Deutsche Forschungsgemeinschaft show stratigraphic transitions between the MCU and the Umbro-Romagna Facies (URF) which would suggest adjacent depositional areas. As the majority of authors considers the rocks of the URF to be more or less autochthonous, the adjacent MCU has to be of a similar tectonic state. Stratigraphic transitions between the MCU and the URF had been repeatedly postulated [MERLA 1952; GHELARDONI *et al.* 1962] but in fact sedimentary contacts have not been observed. Also, a lateral transition zone (close stipples, fig. 1) is no more considered because its sandstones fit either into the MCU or into the URF. However, vertical stratigraphic transitions, have verified : The Suviana Formation (fig. 1; "Porretta F." of LIPPARINI 1944, AMADESI 1967; "Civago Marls" and "Marnoso Arenacea", GHELARDONI *et al.* 1962) of the MCU has been found to be identical with the lower Marnoso Arenacea Formation of the URF.

The meaning of the Prato-Sillaro Lineament (PSL)

The synsedimentary tectonics of the PSL account for the sharp decrease of the Marnoso Arenacea F. west of the PSL in thickness and distribution to appear there as the Suviana F. (fig. 1). After deposition of the major portion of the MCU it started uplifting on both sides of the PSL. Synchronously, the Marnoso Arenacea trough (URF) began forming southeast of the PSL. Within a short interval in the Mid-Miocene both the rising MCU trough and the subsiding URF trough were on the same submarine level. Thereby they received exactly the same sediments : the lower Marnoso Arenacea F. southeast, and the Suviana F. northwest of the PSL. After this interval the deposition of the MCU closed whereas the major portion of the Marnoso Arenacea F. was now being deposited. A subsequent thrust of the MCU over the rocks of the URF restricted to the segment southeast of the PSL. So it is the PSL that, in the northwestern segment, allowed the Suviana F. to remain in its original stratigraphic bond with the MCU, and therefore permits the recognition of the stratigraphic transition between the Modino-Cervarola Unit and the Umbro-Romagna Facies.

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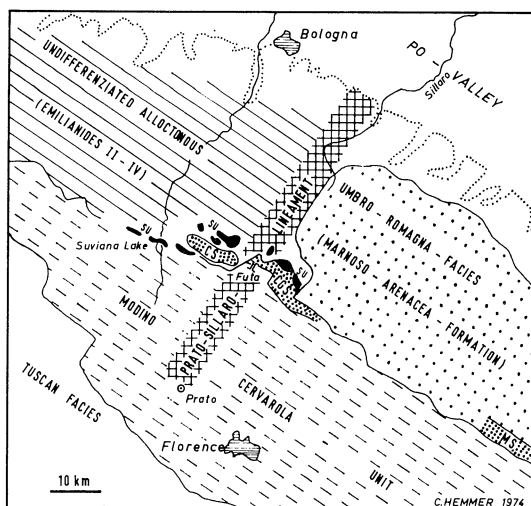


FIG. 1. : Facies distribution in the Northern Apennines (after REUTTER 1968) and location of the Prato-Sillaro Lineament. CGS Castel Guerrino Sandstone (GROSCURTH 1971); CS Castiglione Sandstone (HEMMER 1966); MS Mandrioli Sandstone (FREY 1969); SU (black areas) Suvania Formation (HEMMER 1966); stippled line : margin of the Po Valley.

Conclusion

The entire lineament crossed, next to the URF and MCU troughs, also the Tuscan trough [“ Livorno-Prato-Tract ”, BORTOLOTTI 1966] thereby causing facies variations in each trough. This suggests, together with the stratigraphic transition between the MCU and URF, an paleogeographic pattern of depositional areas according to the recent facies distributions (fig. 1). In the case of greater dislocations as postulated by various authors, the foregoing considerations would seem to indicate that a major crustal plate, including the three throughs and the Prato-Sillaro Lineament, has been transported as a whole.